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Bell Telephone MAGAZINE

Telephones Are in the Fight on Every Battleground • MAJOR GENERAL HARRY C. INGLES

The Bell System's Safety Observation Plan • ERLE S. MINER

We Don't Like to Say "No" • JOHN W. ORD

Recreation Facilities for Bell System Women • RAYMOND A. STEELMAN

When a Circus Burns • RAYMOND A. LORING

American Telephone & Telegraph Company • New York

Bell Telephone Magazine

Summer 1944

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"The ideal and aim of the American Telephone and Telegraph Company and its Associated Companies is a telephone service for the nation, free, so far as humanly possible, from imperfections, errors, or delays, and enabling anyone anywhere to pick up a telephone and talk to anyone else anywhere else, clearly, quickly and at a reasonable cost."

A Medium of Suggestion & a Record of Progress

Published for the supervisory forces of the Bell System by the Information Department of American Telephone and Telegraph Co., *195 Broadway, New York 7, N. Y.*
Walter S. Gifford, *President;* Robert H. Strahan, *Secretary;* Donald R. Belcher, *Treasurer*

Who's Who & What's What *in This Issue*

AS BETWEEN a "GI Joe" observing from a foxhole, with a telephone for company and field wire his only link with the command post, and the Chief Signal Officer of the Army, both of whom have an intense comprehension of the importance of communications in battle, the former has doubtless a more directly personal interest in them—but the latter has the broader, the world-wide view. So we are happy indeed to have the name of Major General Harry C. Ingles at the head of the list of contributors to this issue. Graduated from West Point in 1914, he is a Signal Corps officer who in recent years has been a member of the General Staff of the War Department; G-3 of the Caribbean Defense Command and later Chief of Staff of that Command; and Commander of the Mobile Ground Forces of the Panama Canal Department. He went overseas in 1942, and later became Deputy Commander of the United States Forces in the European theater of operations. He was appointed Chief Signal Officer, A. U. S., on July 1, 1943.

VARIOUS ASSIGNMENTS in the plant department of the Southwestern Bell Telephone Company, including central-office repairman, division plant engineer, general plant installation supervisor, and general plant training supervisor, occupied ERLE MINER from 1922 to 1929. This experience gave him a first-hand view of the System's training and safety programs from both the practical and the administrative standpoints. In 1929 he was transferred to the Department of Operation and Engineering of A. T. & T., to work on plant training problems, and in 1937 he became safety engineer—the position he now holds. His most recent previous contribution to this MAGAZINE was "First Aid Training in the Bell System," published in the issue of November, 1942.

THE NAME of JOHN at the head of MR. ORD'S article will appear strange to the

Maj. Gen. H. C. Ingles

Erle S. Miner

John W. Ord

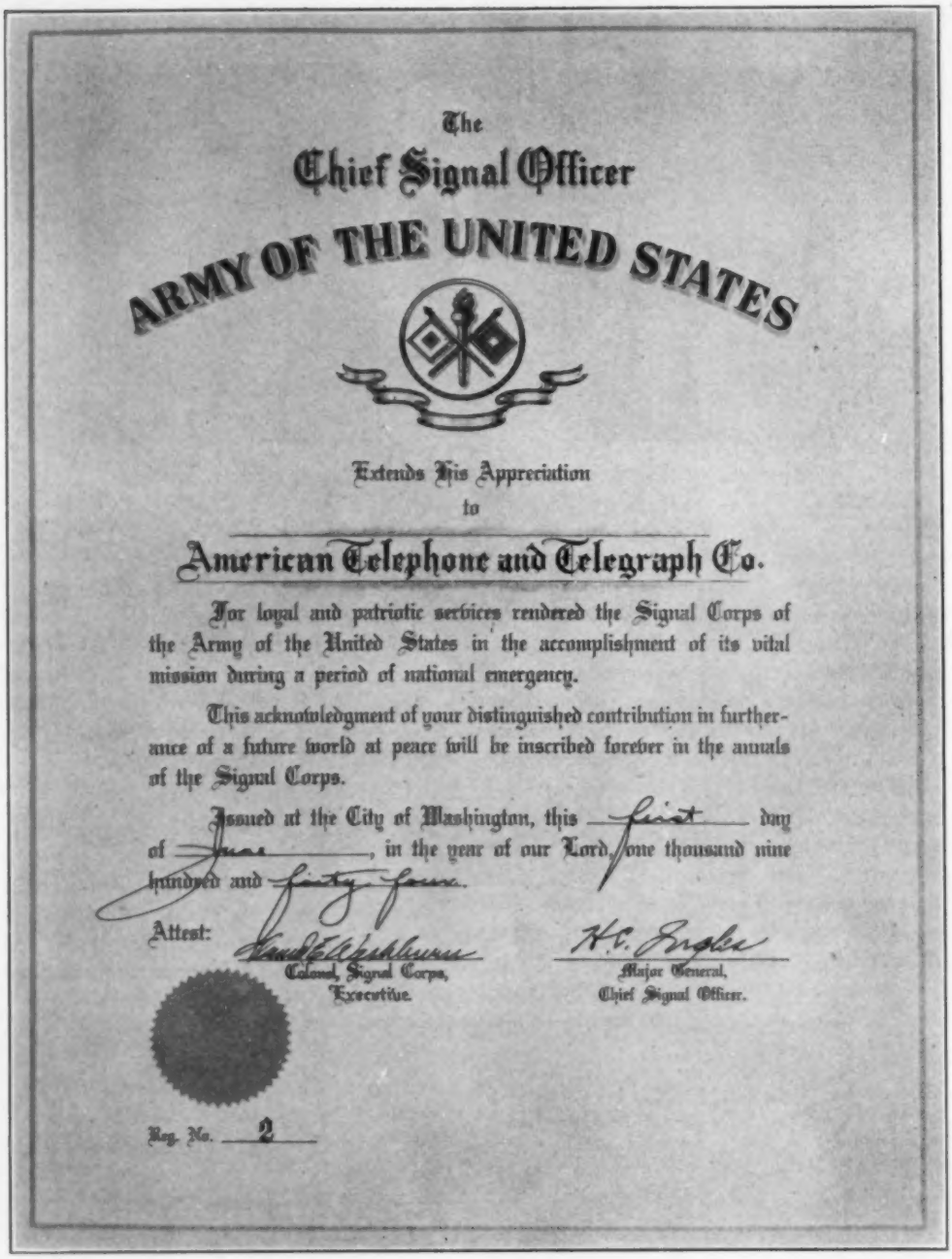
Raymond A. Steelman

Raymond A. Loring

host of his System friends who know him only as JACK. Like many another versatile telephone man, he has had experience in both commercial and traffic departments; but, unlike most Bell System people, he was born in England, and began his telephone career, in 1913, with the Bell Telephone Company of Canada. There he progressed, with an interlude of five years out for war, until he came to the A. T. & T. Company in 1926. Since then he has been, in the Commercial Division of the O. & E. Department, an engineer; general commercial problems engineer; sales engineer—in the days when sales were something to be sought and not to be avoided; and, since the beginning of 1942, commercial results engineer.

WAR HAS PLACED special emphasis on certain phases of the telephone job which might not seem, at first glance, to be particularly affected. RAY STEELMAN felt that his story could best be highlighted by pictures, and so has provided more pages of photographs than of text—a reversal of the usual space proportions which is also evident in the first article of this issue. From 1916 to 1922 he was in charge of employees' dining service in Philadelphia for the Bell Telephone Company of Pennsylvania. Since that time he has been in the traffic division of A. T. & T. Company's O. & E. Department, and closely concerned with—among other matters—the maintenance of the various types of quarters he discusses. He was the author of "War-Time in the Traffic Departments," in the MAGAZINE for August, 1942.

THE MORE DISASTROUS or the more horrible a catastrophe may be, the greater is the need for fast and reliable communications: to call for help, to alleviate suffering, to bring reassurance—and the greater too is the test of the telephone organization, and the opportunity for telephone people to perform helpful services. Had the circus "big top" burned in any other city, the response of telephone men and women there would have been much the same—since the spirit of service is the common possession of them all. But it happened in Hartford, and so it is RAYMOND A. LORING, general information manager of the Southern New England Telephone Company, who tells the tragic story in this issue. His training and experience as newspaper reporter and editor in Springfield, Providence, and New Haven, before he joined the Southern New England Company in 1931, are reflected in the vivid phrases of his narrative.


The
Chief Signal Officer
ARMY OF THE UNITED STATES

Extends His Appreciation
to

American Telephone and Telegraph Co.

For loyal and patriotic services rendered the Signal Corps of the Army of the United States in the accomplishment of its vital mission during a period of national emergency.

This acknowledgment of your distinguished contribution in furtherance of a future world at peace will be inscribed forever in the annals of the Signal Corps.

Issued at the City of Washington, this first day of June, in the year of our Lord one thousand nine hundred and forty four.

Attest:

Colonel, Signal Corps,
Executive.

H. C. Ingles
Major General,
Chief Signal Officer.

Reg. No. 2

THIS IS A reproduction in reduced size of the "Certificate of Appreciation" which Major General Harry C. Ingles, Chief Signal Officer, A. U. S., presented to the American Telephone and Telegraph Company on June 23. For a quotation of part of the General's remarks on that occasion, see page 71.

In All Theaters of Operation, Wire and Radio Communication and the Men Who Install and Maintain It Help to Coördinate the Army's Tremendous Striking Power

Telephones Are in the Fight on Every Battleground

Major General Harry C. Ingles

Chief Signal Officer, U. S. Army

THE MODERN TELEPHONE, whether using wire lines or radio waves to transmit its messages, has helped to give our combat forces in this war a coördinated striking power never before approached by this or any other nation.

In the forward battle areas with American fighting men around the globe, the telephone—long taken for granted in the every-day life of our people—is a powerful weapon of both attack and defense. Back of the lines, too, at regimental, division, and general headquarters and on to the Commander-in-Chief, millions of telephones speed the messages of war over lines which knit the whole mighty effort together into a pattern for victory.

Let us examine here the job the telephone and the other instruments of rapid communication are doing as front-line combatants, and see how they are performing out there where the bullets and shells and bombs measure a man's life in minutes or seconds—minutes or seconds in which a field telephone and a few hundred yards of assault wire may spell the difference between life and death for the men who face the enemy.

It is too soon after the invasion of Normandy, as this is written, to be able to cite specific instances of the incalculable importance of quick communications in that vast and hazardous and complicated operation. But what part they are playing in the major assault upon "Fortress Europe" may be inferred without difficulty both from news stories of our progress there and from what can be told of earlier actions and successes.

TELEPHONE CABLE, telephone wire, telephone poles stored in England in anticipation of the invasion await transportation to the Continent

FRANCE

LEFT: Beach master, with microphone and loud speaker. Below: Half-tracks and a "duck" mark a successful landing as the men move inland, supported by naval gunfire

This is by way of an account, then, of how brave men give their lives to establish and keep open the lines of communication so vital to the success of every operation, and of how equipment furnished by the Signal Corps to all branches of the Army makes it possible to weld together all units into a powerful and integrated military force. Like a well-run football team, our Army has its offensive and defensive signals. It receives them by wire and radio as the battle progresses.

IN ITALY, our Signal Corps units swarmed ashore with the first waves at Salerno. Some 200 tons of communication equipment were brought ashore during the first few days; and 700 miles of telephone wire—400 miles of fixed wire and 300 of assault wire—were installed within the first 10 days of the invasion. In the first 18 hours, they set up four switchboards close to the beaches, as well as six telegraph sets, and had a communications system operating over a wide area. Linemen, repairmen, and operators came ashore in the thick of the battle, carrying their own equipment.

Early in the fight, two jeeps carrying signal equipment were put out of action, thus cutting down the mobility of the signalmen, but these telephone crews loaded onto their backs all the equipment they could carry and went ahead, sometimes on their bellies, stringing wire and getting switchboards and other apparatus into operation.

They had hoped to salvage some of the wire left behind by the Germans, but they were disappointed, for the enemy had not only cut the wire

The Signal Corps' Appreciation

THE SIGNAL CORPS, U. S. Army, has awarded to the American Telephone and Telegraph Company a "Certificate of Appreciation" (see page 68). Presenting the Certificate to President Walter S. Gifford during ceremonies held on June 23, Major General Harry C. Ingles, Chief Signal Officer, said in part:

"It is especially appropriate that this well deserved recognition of American Telephone and Telegraph Company's tremendous contribution to the war effort should come at this time—when Allied accomplishments on the beachheads of France are fresh in everyone's mind. . . .

"Time has always been a precious commodity in war-time, and A. T. & T.'s willing coöperation has been a valuable factor in beating the enemy to the punch. It has been possible on numerous occasions to accomplish in hours tasks that ordinarily would have required weeks.

"This work—often above and beyond the normal requirements of duty—is not reflected in any one section of A. T. & T., but it exists through all echelons, from the operators on the switchboard and the technicians in its laboratory to the highest executives.

"The eagerness and enthusiasm demonstrated by all individuals of A. T. & T. have been a source of constant pleasure and satisfaction to the Signal Corps. We are sure it will continue to be so—for the job is not yet finished."

FRANCE

ONCE the beach heads are secured, there comes the stupendous task of bringing in the reënforcements—a constant and increasing stream of men and supplies

AIR SUPPORT is vital to a successful invasion. Note the throat transmitter and ear phones of this calm young co-pilot of the Eighth Air Force

CAMOUFLAGE and portable equipment indicate that this Army invasion message center is not far from the scene of battle, yet voice communication has already been established

MEMBERS of an American reconnaissance unit report by radio telephone, from a battered street in Montebourg, the passage of Allied aircraft overhead

THE "Spiral-4" and other field telephone cable shown in this picture is installed in the first Army headquarters on the Normandy beach head

IN CHERBOURG, soon after its capture from the Germans, natives and American troops listen with deep absorption to announcements about the progress of the Allies in battle only a few miles away

HIDDEN AWAY under ground, this is the "main frame room" of the telephone switchboard installation at Allied headquarters

ITALY

TWO MEMBERS of the American Fifth Army create a concealing fog while the man in the fox hole telephones reports as it spreads over the valley of the Garigliano River

but had carried away whole sections of it so as to make any salvaging operation extremely difficult. To make things even tougher, Jerry had cut down some of the poles and burned others to prevent their use by the Fifth Army. Some poles were left, but these were rigged with booby traps.

FORMIDABLE natural barriers and an enemy sharply aware of the importance of communication lines added further to the difficulties on the Fifth Army front. Italian rivers, swollen by heavy rains and well covered by enemy machine gun and small arms fire, claimed the lives of many signalmen, our official reports show.

"Despite biting cold and strenuous hostile opposition, linemen have waded and swum the rivers in order to establish lines of communications," said one report. "The procedure is to tie a section of the wire or cable around a man's waist, bid him 'good luck' and try to cover his crossing with supporting fire. Once over, it becomes necessary for the swimmer to dig in and take whatever the enemy offers in opposition, then set up for business when the fire lessens, so that communications with the forward division can be established as speedily as possible."

Not only must Signal Corps units establish the communication lines, but they often must defend them. On that same Salerno beachhead, 16 powerful radio sets had been installed when a German attack was launched. The attack was successful in that it forced a temporary withdrawal of all Allied units—except the radio team of a signal battalion, which got orders to hold at any cost.

"For 20 hours," the official report said, "this detachment remained the most advanced unit of the Fifth Army, almost four miles ahead of any possible support. At no time during the enemy thrust had communications been lost, although a German patrol attempted to destroy a transmitter installation. Radio operators, maintenance men, and officers grabbed sub-machine guns, rifles, and carbines, and repulsed the patrol with losses."

The unit finally withdrew, but only after receiving orders to do so. At a critical stage of events, it had prevented a confused military situation from becoming a chaotic one.

During the first 22 days of the invasion of Italy, more than 5,300 miles of assault wire, field wire, and cable were laid by our Signal Corps units—an average of better than 240 miles a day. This was accomplished in spite of adverse weather and difficult terrain. Whereas, in earlier campaigns, linemen worked from standard military vehicles adapted specifically to their work, they were forced here to resort to mules, carts, jeeps, and even bicycles. It was not unusual to see linemen unrolling huge spools of wire or cable by hand, while other men of their units were on constant patrol duty against enemy forays.

A Liaison Service

SIGNAL CORPS communications are not limited to land operations. Contact with ships in the harbor was established at almost the precise moment the first troops set foot ashore in Italy. And, in order to furnish the high command with the necessary verbal picture, the signalmen frequently got out ahead of the combat

PICTURED during the campaign in Sicily, this is the switchboard room at the Signal Section of the American Fifth Army

PORTABLE carrier equipment and telephone and teletypewriter in the Signal Center photograph

ITALY

TESTING CIRCUITS and looking for a wire break, these two men were snapped near the front during action in Sicily

MEMBERS of an anti-aircraft battery are dug in by the tracker unit of an M-9 electrical gun director. The man at the right is in touch with a portable information center which plots electrically the flight of approaching enemy planes

THE CREW MEMBER with the telephone receives from the computer unit of the M-9 Director, and gives to the team, the word to fire. Fuses are set and gun is aimed automatically

IN constant touch with their own forces by telephone, these U. S. soldiers are on reconnaissance for an artillery battalion in Tunisia

NORTH AFRICA

HERE a couple of American soldiers are laying field wire in rugged terrain

SOMEWHERE near Algiers, French soldiers learn from American soldiers how to operate a field telephone switchboard. To the right is an Army scout car with radio telephone equipment

troops. One signal company in Italy actually went ahead of the Infantry, with the result that the information they phoned back to the heavy guns of the destroyers, cruisers, and other craft brought about the destruction of German Mark IV tanks which had threatened the whole landing party.

One observer attached to the Fifth Army reported that, although virtually every type of signal equipment was in use during the landing operations in Italy, the handie-talkie won its full share of acclaim from the men. This small portable radio set, which permits the platoon to communicate with its company commander or battalion leader instantly, provided much-needed contact with isolated groups and parties sent forward to reconnoiter.

THE BATTLE for the Salerno beachhead offered a first-rate example of how modern communications are used to coördinate the work of the ground force and its supporting air arm. When the battle began, coöperation between the ground troops and the Army Air Forces was so precise that dive-bombing requests from the Infantry were actually passed on to the attacking planes while they were in the air on their way to, or immediately over, the invasion area.

Fighter-bombers and dive-bombers hit enemy positions within 10 to 30 minutes after the ground troops had relayed the location of the targets. By the use of radio telephone equipment furnished by the Signal Corps, direct contact was maintained between the Infantry and the AAF's ground control station on the beachhead. When advanced ground forces needed supporting aircraft to hit strong enemy emplacements, messages were relayed to the control station and immediately radioed to the air elements. The control station operator described the exact nature of the target, its location and importance, and actually briefed the pilots while they were in the air heading toward the battle ground, we learn from AAF sources.

AAF personnel at Salerno reported that one of the principal reasons they were able to afford a protective aerial screen for the landing operations was the fighter control system. One fighter pilot put it this way:

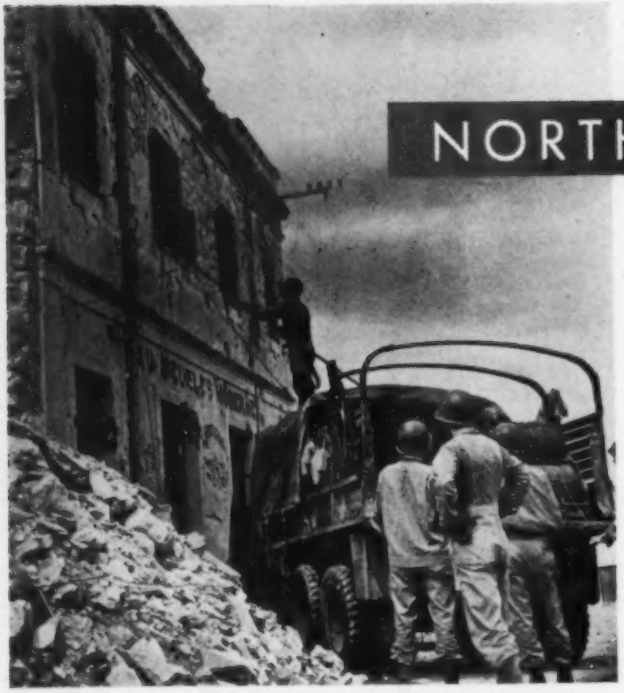
"That control system was marvelous. I remember once when they called me and said, 'Fighters approaching you, now a mile away,' and gave me the direction. Then they called back and reported, 'Fighters now half a mile away.' A moment later they called and said, 'Heads up, here they are.' I looked in the designated position and, sure enough, there were the Germans."

Wire and Radio

WIRE and radio communications supplement each other in this war. A battalion wire chief with an infantry division, recently returned to the United States on rotation furlough, said the German artillery fire was so fierce and continuous at the Anzio beachhead that American linemen had to work 24-hour shifts to keep communications open. His outfit, he reported, laid more wire at Anzio than anywhere in Africa or Sicily.

"Twice our Command Post was blasted over our heads," he related, "and although we finally resorted to using double lines and radio, we had

NORTH AFRICA



U. S. SIGNAL CORPS linemen string telephone wires through Mateur a few hours after forward troops had taken the town

ON tall French poles that line the road to Gabes, Signal Corps men run American telephone wires while battle rages in the distance

EARLY in the African occupation this Army operator dug his switchboard in behind the beach to serve a battalion headquarters

a hard time keeping communications open."

This man, incidentally, received the Purple Heart for wounds sustained near San Stefano in Sicily last year. Of this he said:

"We were putting in wire at 'Million-Dollar Hill' and a shrapnel burst got me. We called it 'Million-Dollar Hill' because we figured we threw a million dollars' worth of artillery shells at it. Then the Infantry had to go in and dig the enemy out."

The Sicilian Campaign

ALTHOUGH radio was widely used during military operations in Sicily, wire remained a vital medium of combat communications. Reports from commanders of Signal Corps field units emphasized the ability of wire-laying crews to maintain communications at a pace which matched that of the advancing Infantry. The security and accuracy with which a large volume of traffic was carried by telephone lines were also cited.

During the battle for San Fratello, it was necessary to lay a five-mile line of wire over a rocky, trackless mountainside where a man could move only by the frequent use of his hands, and another line for 15 miles where the wire could only be carried by pack animals and laid by hand. One six-mile line from the coast road to San Marco required 24 hours to put in operation because the winding, narrow mountain road on which it was laid was under constant shell-fire.

In the landing operations in Sicily, the wire was brought ashore and laid from quarter-ton trucks. Additional wire was landed and transported inland in two-wheeled, quarter-ton trailers, six miles of wire being carried with each of the signal teams landed. Wire communication with all regiments was put in operation as soon as physical contact with the regiments was established.

An Infantry commander added this commendation to the work of the communications troops in Sicily:

"During the operation, wire communication was desirable down to rifle companies and battalion observation posts. The terrain was very mountainous and the highways impassable to vehicles, due to blown bridges and anti-tank mines. Thus it was necessary for the battalion communications platoons to carry their wire and equipment by hand. . . . Lines frequently were broken by artillery and mortar fire, by animals and vehicles, and sometimes by enemy patrols."

IT WAS estimated that communication units in Sicily rehabilitated 950 pole line miles, 49,176 wire miles, and 24,588 circuit miles of communications. In addition, they laid more than 1,800 miles of Spiral-4 cable, over which seven telephone and telegraph messages can be transmitted simultaneously and secretly when utilized with "carrier" equipment.

Spiral-4 cable was used with great success in North Africa, Sicily, and Italy. It combines the advantages of multi-channel telephony with the speed with which the cable can be laid. Its quarter-mile lengths are snapped together with waterproof connectors as rapidly as the flexible cable is unreeled. While the cable is usually laid along the ground, it can be buried when time and condi-

COMMUNICATION with island or carrier base and within the plane is important in connection with landings on the islands of the Pacific

PACIFIC

MARINES set up this switchboard on a beach on a Southwest Pacific island

LANDING CRAFT bring vast quantities of supplies ashore —on one of the Marshalls group in this picture. Note the men at the lower right who are establishing communications

tions permit, thus protecting it from damage by vehicles or marching troops, or by the enemy.

In Sicily, American wire teams found several German lines equivalent to our Spiral-4, but it was far quicker for them to lay new Spiral-4 than to attempt to service or rehabilitate the German cable, in view of difficulties in locating the faults.

In North Africa

MUCH of our success in the North African campaign was attributed to the accuracy of our concentrated artillery fire.

As one artillery officer put it: "We gave them a hell of a beating. We have such good communications that we can lay down concentrations of our guns at any point at any time, and there isn't much that can come through alive."

Sometimes the old Yank ingenuity was put to severe test to provide the communications necessary for artillery fire control. I like this story of a triple play pulled on the Germans in the drive toward Bizerte:

Our forces had driven north of Lake Achkel, west of Bizerte, and were being held up by German batteries. Our guns were in a position to fire from that position, but the cannoneers couldn't find a high point from which they could get a forward observation. Another American combat team, which was without artillery support, had taken a crest south of the lake. These men could see the enemy gun positions and were preparing to act as observers for our batteries north of the lake when direct comunications failed.

But the Yanks were not to be balked. From the crest south of the lake an observer routed a call over Army signal lines to a switchboard 100 miles to the rear, thence forward over another circuit to our guns north of the lake. In a few minutes he had adjusted the fire of the Yank batteries and their shells began dropping on enemy gun positions, with the result that the Germans withdrew hastily and the American advance continued.

WHILE WIRE has been a basic medium of communication in the European, African, Mediterranean, and Caribbean theaters of operations, radio is not only the primary means but in many cases the only method of communication in the Pacific, because of the huge expanse of water over which our war with Japan is being waged. Out there our offensive has been a series of landing operations, and in these landings radio carries the main burden, particularly until our men have been put ashore. Wire is used laterally after landings are accomplished, and inland after the beachhead is established. Telephones are used to especially good advantage in connecting the beach with inland fire control parties.

Where possible, every effort is made to maintain wire circuits for ground troops. For security reasons, radio silence is observed when wire lines are operating. Radio circuits are usually necessary for contact with reconnaissance elements which are landed on other islands or at distant points on the same island. Such was the case at Guadalcanal.

In the Pacific

I RETURNED not long ago from an inspection tour of Signal Corps installations in the Central, South, and

THESE Signal Corps men are getting ready to run field telephone wire along the edge of a swamp in New Guinea with the help of husky natives and an outrigger canoe

TELEPHONE field wire is being paid out under heavy guard from a "duck" on one of the Admiralty islands

THESE American soldiers (below) are advancing under Japanese fire. The second man is reporting by telephone

Southwest Pacific theaters. The jungles in the Solomons and New Guinea are the worst I have ever seen—much more difficult than those of Central and South America. They have such a blanketing effect on radio that the walkie-talkies don't transmit with their normal range, particularly if the jungle is wet. This is one of the reasons why the Signal Corps lays telephone wire networks on shore as soon as possible in these islands.

Our communication problems in the Pacific theaters are somewhat different from those in Europe, but they are equally hazardous. Here, as in all other theaters, Signal Corps men are found among the advance detachments. Along with the Infantry, they splash ashore from the snub-nosed landing craft in the face of bitter enemy resistance, to wrest from the Japanese another stepping stone on the road to Tokio. And while the Infantry crashes through the tropical brush picking off the stubborn Japanese, our signal troops don leg irons and climb trees through which bullets are whizzing, to string the telephone wires which will connect the task force and its individual units with the Division Command Post.

Occasionally one of these linemen a-top a tree-pole will hook his pliers to his belt and pull out an automatic pistol to send a Japanese sniper hurtling from his tree-top perch. Then, re-holstering his automatic, the Yank lineman will take up his pliers and go on with his job of wire splicing.

Jungle Right-of-Way

SOMETIMES a signal company is called upon to clear its own right-of-way and build a telephone pole line through uncharted jungles and across mountains. Such was the mission of Company C, an untried outfit which disembarked from LST boats at Lae just after it was retaken from the Japanese.

Company C's job was to construct the line in a river valley through miles of New Guinea jungle and mountains, Kuna grass and marshes, forest rivers and insects. Engineer units had cut through here and there along the route to build air strips, and it was to supply these bases with communications as well as eventually to establish longer lines to bases not then captured, that the project was undertaken.

True, units of an aviation signal construction battalion had previously pioneered a route to the air strips, but the pole line was to follow this route only in part. The aviation signalmen had strung Spiral-4 cable along the ground, and this cable was in operation when Company C came along. But building a pole line was something else. It required from eight to 20 tons of material to the mile, and its builders needed a ton of food and other expendables per day. Every ounce of it had to be brought from Lae over an ever-lengthening line.

For the first leg of the line there were no poles, so the outfit cut its own poles while clearing the right-of-way. It took from October 11 to January 17 to push the pole line 25 miles, and the worst trials were still ahead. They got help from the Australians in the form of 120 officers and men; supplies came by truck from the Headquarters company; and the Air Force furnished "biscuit bomber"

PACIFIC

THE "lineman's helper" at the right on this palm tree which is about to become a telephone pole needs no climbers

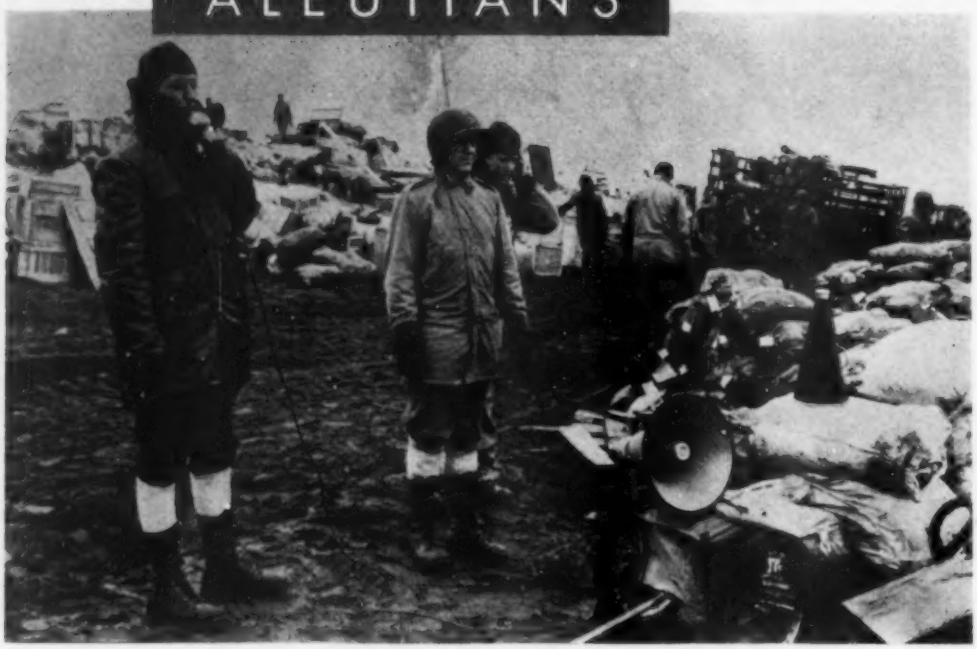
THIS mortar battery is "on call" at any time to lob a few at the Japs on the Arawe peninsula

A MARINE CORPS communication unit stands by at radio telephones on the beach at Roi Island of the Kwajalein atoll

THIS PICTURE gives some idea of what it is like to build a telephone pole line through the New Guinea jungle

TWO STRANDS of "Spiral-4" telephone cable are about to go amphibious and become submarine cable for a short distance

ALEUTIANS



COMMUNICATIONS played an important part in the occupation of Attu. Here a beach master is giving directions through microphone and loud speaker to landing vessels which are bringing more supplies ashore

THE AMERICANS found this Japanese telephone shack intact after the enemy had fled Kiska, and took it over and put it to use at once

ABOARD SHIP, these men of the Army Signal Corps keep in touch with a landing party by means of this radio telephone equipment

planes that regularly dropped rations and supplies to the advance party laying out the route miles ahead of the construction teams.

Yes, they finished the job. Their worst enemies wore no uniforms. Instead, their fight was against raging rivers, clinging grass, enveloping mud, stubborn jungle, towering mountains, tiny insects, and tinier germs.

Japs on the Line

THE JAPANESE place strong emphasis on disrupting our lines. Our soldiers often can traverse wide areas, known to be infested with enemy snipers, without drawing a single shot; but let a single soldier of ours stop and appear to be repairing a break in a telephone line, and immediately snipers' bullets will begin to whine all around him.

On one Pacific island Jap bayonets severed our wires in some areas at an average interval of 20 feet. This disrupted communications rearward for some time. In other cases, the enemy used bayonets to scrape insulation off our wires, grounding circuits. The Intelligence Center reported an incident in which a Japanese was killed while tampering with one of our wires. An American lineman found his stiffened body, with both hands clutching the wire; the wire also was clamped between the dead man's tightly gritted teeth. He had stripped the insulation cleanly for at least six inches, to short the circuit.

THE SOUND-POWERED telephone, used extensively in the Navy, has also proven valuable to ground troops in the Pacific. Its worth was demonstrated as long ago as the capture of Guadalcanal, where it was used for fire control of infantry mortars and of units within an infantry company. Since at night all men were told to stay in their foxholes and warned that anyone moving about would be fired upon, these telephones gave the company commander control of his small units without the necessity of moving about.

Because of the short land distances involved in the Pacific island operations, the sound-powered telephone also has been used effectively for artillery fire control. Absence of batteries, which are susceptible to deterioration from the humidity and dampness of the islands, makes this instrument smaller, lighter, and more durable than battery-powered telephones.

THE REPORT brought back to the United States recently by Colonel Philip G. Cochran, commander of the First Air Commando Force in Burma, told how greatly an excellent radio communication system contributed to the successful operations of the Anglo-American forces behind Japanese lines. The British Chindit Forces, commanded by the late Major General Orde C. Wingate, were on the ground and Colonel Cochran's Air Commandos were supporting them.

"The British found targets and then got us on the radio," Colonel Cochran related. "We went to greater detail on ground support than I have ever heard of.

"We had a system where I could call any of our fields in Burma. I'd say, 'Get me Clint on Broadway,' (the name the Commandos gave one

MAJOR GENERAL CLAIRE L. CHENNAULT, commander of the U. S. Fourteenth Air Force in China, directs operations from his command post during a Jap air raid. Note the field telephone switchboard

U. S. ARMY ENGINEERS build a communication line along the new Ledo Road in North Burma

BURMA

CONTACT with observers is maintained by radio telephone as these American troops in Burma wait for the signal to attack a Jap machine gun nest

of their fields). I would get him and say, 'What do you need?' He might say, '500 gallons of gas and food.' I'd say, 'O.K.,' and the cargo planes would take it to him."

The Signal Corps and the Telephone Companies

IN ALL, the Signal Corps is supplying more than 90,000 different items to our fighting men. Even the most sensitive electrical equipment is standing up remarkably well, considering the terrific beating it takes when it is unloaded in landing nets and dumped on beaches in all kinds of weather. Water- and fungus-proofing are undoubtedly adding to the life of the equipment.

This fine equipment would mean nothing without the skill and bravery of the men out there in the front lines. I have unbounded admiration for those who have given their lives, and for the other thousands who have risked theirs, in order that the all-important communication lines be kept open. War Department records tell the story of many thousands of signal men who have exposed themselves to enemy bullets, and even to battle cross-fire, while laying sorely needed communication lines or repairing lines damaged in battle. Many of them have been decorated by their Government for extraordinary heroism and devotion to duty.

It has been said before now that all telephone people are, indirectly at least, members of the Signal Corps. That is well deserved recognition of the importance of communications, and of those who provide it, on the home front. On all the fighting fronts, as you who read this undoubtedly know, are thousands of men who

Communications and Air Power

How important is a communications man? Three or four years ago, when you or I sent a telegram across the continent or made a long distance call, we never considered the number of people involved, nor did we consider the speed and efficient service any great feat. However, today, many of us have begun to realize that communications are a big factor in winning a war. Yet, very few of us now are aware of just how important the passing of information from one point to another really can be. It is essential to all arms of the service; and, if possible, more important to the Air Forces than to any of the others.

With airplanes flying faster and covering greater distances as each year passes, we find that communications have become speedier, more efficient, and much more essential. This increase in importance of communications has automatically increased the importance of the personnel involved. Every landing, every flight, every bombing mission, and every fighter engagement cannot be accomplished without involving scores of specialists in the communications world. In the Philippines and in Australia, I have seen many times a mission whose success depended greatly upon the efficiency of communications. Because it is a job for skilled specialists, because it is a twenty-four hour duty, and because it means many times the success or failure of the mission, communications are and will be one of the most vital duties during this war.

GENERAL H. H. ARNOLD
Commanding General, AAF

joined the Signal Corps directly from the ranks of telephone companies all over the United States. So did many others who have been assigned to comunications jobs in other units. Their peace-time training and experience have proved invaluable to the Army. To them, and to the organizations from which they came, I take the opportunity afforded to me in this telephone publication to give cordial and grateful recognition.

IN THE MIDST of the gunfire and sacrifice is a love of familiar things back home. In New Guinea, I visited one of the signal headquarters, which consisted of a one-story shack made of salvaged lumber and grass. There was a sign about as tall as the shack itself, and on it was painted in large letters: "The Pentagon."

It made me feel very much at home.

Home is exactly where every last one of our fighting men wants to be just as soon as the enemy is thoroughly beaten. To speed the day of his return, we of the Signal Corps, with the help of the great communications industry, will see to it that he is given every military advantage that expert communications can provide.

WE ARE, of course, thinking about post-war problems, but we realize that our most important contribution to post-war is to hasten the day of victory; for nothing can contribute more to our country's prosperity and well-being than the earliest possible victorious ending of the war—both in Europe and in the Pacific. The longer the war lasts, the greater the loss of life; the greater the number of wounded who will be permanently disabled; the greater the national debt; the greater the risk of dangerous inflation; and the greater the danger of peacetime continuation of wartime governmental controls—for the longer these have to be in effect because of the war, the more they tend to become permanent. So, our post-war plans begin with doing everything we can to help win the war as quickly as possible.

There is every indication that we, in the Bell System, will have plenty to do when the war is over. We have the very agreeable prospect of welcoming back our employees who are in the armed services—there are now more than 55,000 of them. Some, I regret to say, can never come back; already there are three hundred and eight gold stars on our flag. Some—very few I hope—will have been disabled and will need special attention to fit them into jobs they can fill. Others may need training in new skills, but all will get a personal and a warm welcome.

From President Walter S. Gifford's statement to A. T. & T. stockholders at the Annual Meeting on April 19.

The System's Safety Program Is Based on the Principle That Fewer Unsafe Practices Mean Fewer Accidents and Fewer Accidents Mean Fewer Injuries

The Bell System's Safety Observation Plan

Erle S. Miner

PROMOTION OF SAFETY is a never-ceasing activity in the Bell System. Not that telephone work is unduly hazardous; but each personal injury, serious or minor, which does occur as the result of an accident is potentially a human tragedy—and ought not to have occurred. Much more than just a catch phrase is the challenging slogan: NO JOB IS SO IMPORTANT AND NO SERVICE IS SO URGENT THAT WE CANNOT TAKE TIME TO PERFORM OUR WORK SAFELY.

Experience has proved that sporadic "safety campaigns" are only temporarily effective; and as the need for education and for the adoption of safe working habits has become better understood, there has been a paralleling development in the methods by which these may be accomplished.

One method recently introduced in the System, and already promising to be of great value, is the Safety Observation Plan. Its principal feature is that, in carrying on their day-to-day jobs, Plant Department supervisors at the various organization levels, and particularly the first-line supervisors who are directly responsible for the safety of their men, make "observations" of work while it is in progress. Observations cover the use of tools, material, and equipment, as well as any unsafe method or order of procedure in performing the work which indicates a lack of planning or failure to take into account all the circumstances surrounding the particular job.

The plan incorporates procedures developed and used by a number of System companies over a period of years. These procedures have varied somewhat as to the making of the observations, the time allotted, the collecting and summarizing of the data,

and the way in which the data were used. In general, however, provision was made for a series of observations of men while at work so that steps could be taken to reduce unsafe practices. If the number of unsafe practices due to the lack of training and wrong work habits can be reduced, then the probability of accidents and personal injuries resulting from such unsafe methods will also be reduced.

Analyses indicate that some 60 per cent of accidents are caused by the use of non-standard or short-cut methods rather than the safe and proper ways—learned by experience—which are outlined in the Bell System practices, safety codes, and other local instructions. Another 10 per cent of accidents are attributable to faulty supervision and poor planning. Consequently, any procedure that will aid in detecting unsafe practices, their frequency and their causes, can be followed by properly focused training and supervisory efforts leading to a safer and more efficient job.

The plan is similar in some respects to the established preventive-maintenance programs and quality-inspection plans. In these activities, plant conditions are observed, results are studied, and corrective measures are taken prior to the interruption of telephone service. In the safety observation plan, unsafe practices observed at the time the work is being done are normally discussed at the

INTEREST in the Safety Observation Plan begins at the top. Here a general plant manager signifies his approval of its adoption at a meeting of his division plant superintendents

ALL LEVELS of plant supervision get behind the Plan. In this picture a district plant head explains it to a group of first-line supervisors

time with the employee or employees, and corrective measures are taken before accidents can happen. The plan is a sampling procedure for determining the frequency as well as the causes of unsafe work practices, so that preventive efforts may be more effectively directed where required.

The "observations," each usually of 15 to 20 minutes' duration, are recorded on small "Unsafe Practice Observed" forms. Unsafe practices and their causes, as well as recommendations for general training courses, issuance of new or revised instructions, etc., which appear to be desirable, may be made in the space provided. These small forms are forwarded through lines of organization to the district plant superintendent or comparable group head, where they are summarized on larger forms. District summaries are combined to make division and area summaries. District, division and area organizations study the reports and summaries and, on the basis of such information, take action which will assure:

1. That the real underlying causes of the unsafe practices are determined.
2. That needed training projects for certain forces, groups, districts, divisions or areas are designed and carried out.
3. That improvements or changes, if advisable, are made in Bell System practices, safety codes, and other instructions.
4. That additional supervisory attention is given when and where required.

THE Safety Observation Plan provides material for meetings at which line gang or central office force discusses possible hazards associated with the work being planned

ON FIELD TRIPS, supervisors are on the lookout for signs of danger, close calls, work operations carelessly carried out. Meetings on the spot drive home the safe way of doing the job

One Operation—Three Situations

Situation I (left): If, when he is through with the hand axe, the lineman on the pole replaces it securely in the keeper of his body belt, no accident occurs

Situation II (right): In this picture, the man on the pole did not make certain that the axe was securely in its place. It fell, missed by a few inches the man at the foot of the pole, and lies on the sidewalk. An accident occurred—but no injury

Situation III (right): A few inches make a great difference; for the axe this time did strike the head of the man below, causing serious injury—which receives immediate first aid

THESE THREE PICTURES were posed to illustrate that following safe working practices—as shown in *Situation I*, for example—is the key to safe and efficient operation

5. That any other necessary changes are made in the existing safety programs.

In an endeavor to bring about improvements in the plan and to stimulate its functioning, it has been found advisable to discuss the results of the observations at supervisory and employee meetings held at regular intervals throughout the year. Emphasis is placed at these meetings on the safe and efficient way of performing the various work operations, and motion pictures, posters, safety publications, and other aids are used to focus further attention on those practices most likely to result in accidents and personal injuries.

Safe Working Habits Are the First Step

FUNDAMENTAL to the application of the safety observation plan is this principle: *fewer unsafe practices mean fewer accidents, and fewer accidents mean fewer injuries.*

To make clear this point, consider for a moment three situations which are inherent in an operation common and familiar in outside plant work: a pole replacement job.

In Situation I, a line crew is at work, with one lineman up the pole, using a hand axe to make good the attachments transferred from the old pole to the new one. Another lineman is completing the back-fill at the base of the pole. A third lineman has just pulled the "nose bag" up to the first with some additional equipment. The foreman stands nearby, watching the entire operation. Before reaching out for the bag of equipment, the lineman on the pole places the hand axe in the keeper of his body belt—and that is that. There is no accident and therefore no injury.

Situation II is identical except for this one point: the man a-top the pole let go of the hand axe without making sure that it was in the keeper of the body belt. The foreman shouted a warning—but too late. The tool slipped, whizzed past the ear of the lineman at the foot of the pole, bounced on the concrete sidewalk, and came to rest near-by. In Situation II the accident did happen—but the men laughed it off. After all, nobody was hurt.

Situation III also differed only in this one respect: that the hand axe took a different course by a mere six inches—and struck the lineman below on the head. The victim is given skillful first aid and a quick trip to the hospital. He suffers pain, the possibility that the consequence may prove to be serious. Production of that gang is interrupted. That accident resulted in injury.

Now these three situations can be fitted into the basic principle. In Situation III, a man was injured. Situation II is just one of the many cases where something went wrong—but differs from Situation III only because no one was injured. The same series of events took place, but the lineman at the foot of the pole happened to be just outside of the line of the falling hand axe and was uninjured.

BUT WHERE does Situation I fit into the picture? It is the key to the problem, because the events or unsafe practices in Situation I, or a number of similar situations, led up to the accident which caused the injury. It is much too late to apply corrective

action in Situation II, because the unexpected event has happened and it is only by chance that an injury of some kind does not take place.

Who would venture a guess as to how many unsafe acts take place before an accident occurs? How many times before has one man worked on the ground directly below another on the pole, and how many times has the man on the pole placed a tool in the keeper of his body belt without making sure it was fast before he let go? How many times has the foreman permitted one man to work on the ground beneath another man in the air? How many times has the foreman watched his man put tools back in his belt to see if he always makes sure the tool is in the keeper before he lets go? The answer is—many times. Whether the number of "Situations I" or unsafe practices take place a hundred or a thousand times before an accident occurs is not known. But it is evident that in order to reduce the number of injuries to employees, the number of incidents or errors that lead up to the accident must be reduced. That is,

BELL SYSTEM safety practices provide that the employee first make the ladder secure and then make himself secure to the ladder. It helps to prevent falls

A POLE must be tested before it may be climbed. This employee has already determined its condition at the ground line and is here making the pike-pole test

Situation I must not take place if Situations II and III are to be prevented.

The System Safety Record

THAT telephone work is relatively safe is evidenced by recent safety records established by some of the units of the Bell System. One plant division of about 650 men has worked seven years without a single lost-time accident, and an area having 1,500 men has worked more than two years without a lost-time accident. These are but a few of many cases that could be cited, and they all exemplify what can be done.

The telephone companies are not satisfied with outstanding records, however, as long as any accident occurs that could have been prevented. That there is still a job to do is indicated by the following summary of unsafe practices observed during the first year the safety observation plan was in operation in one large organ-

WHILE inspecting cable, this repairman wears two highly important pieces of safety equipment: body belt and safety strap. It is the coöperation of employees in observing such safety practices which makes possible outstanding safety records in the Bell System

ization. It should be remembered that these figures represent the results of many thousands of observations of the work of some two thousand men during the entire year.

Motor Vehicles	342
Tools and Materials	1059
Rubber Equipment	28
Miscellaneous	152
Total	3447

AT THE START of each job, the foreman and his men study what is to be done and plan how to do it. Analysis of potential hazards helps men to work in safety

	Number of Unsafe Practices Observed
Ladders	562
Hand Line	165
Safety Straps and Body Belts	199
Climbers	188
Goggles	97
Poles Aloft	130
Poles, Other	118
Working Aloft, Other	52
Guarding Employees and Public	355

As a matter of further interest, the 562 ladder unsafe practices include 34 cases of over-reaching, 63 cases of not tying pull rope to rung, 33 cases of working on an unguarded ladder at a hazardous location, and others. Space does not permit a detailed list of all the specific unsafe practices included in each classification, but their types can be assumed from the examples given.

While the number of unsafe practices listed above might make it appear that safe practices in this particular organization were extensively disregarded, quite the opposite is true: the total of observations made indicates the extent and thoroughness of the coöperative efforts being made to eliminate accidents.

Fortunately, most of the unsafe practices, whether committed on the job or off, do not result in accidents and personal injuries. Continued improvement lies, of course, in eliminating, in so far as humanly possible, all unsafe and inefficient operations. This is what the safety observation plan is designed to accomplish.

While the plan is similar to other plans developed and used in the plant and other departments, for sampling results and focusing attention on where to obtain improvement, it differs in one important respect: most of the other sampling procedures provide for inspecting the completed work, while the safety observation plan provides for observing the work in progress. For this reason, the plan should be particularly helpful in establishing the habit of observing the circumstances surrounding the job

LIKE ALL plant supervisors, the foreman has a definite part in the Safety Observation Plan. This one is watching a lineman putting a cross arm in place

before the work starts, and looking one step ahead as the work proceeds.

This same habit of always looking one step ahead should be helpful in reducing off-the-job accidents as well as those which happen on the job. This is because a person who has developed this habit on the job will be more likely to look one step ahead and less likely to take short cuts or chances wherever he may be. When a person has developed the habit of always observing circumstances and acting on them to the same degree with which he observes them when driving an automobile or crossing a street, he will not have an accident.

THE Safety Observation Plan, which was made available last year to all Bell System operating companies for study and consideration, has not been in operation a sufficient length of time to determine fully its effectiveness on a System-wide basis. Several companies have reported that it played an important part in reducing accidents during 1943. In one company, for example, where the plan was introduced during the first part of that year, very rapid progress has since been made, lost-time accidents being reduced to less than three-fifths of the number experienced during the previous year. It was the opinion in this company, as well as in other companies having similar experiences, that the stimulation of interest in safety brought about by the preliminary meetings, and by the operation of the plan itself, was the principal contributing factor in reducing accidents in their territories.

Experience with the plan indicates that it can be introduced and administered so as to enlist unstinted cooperation from all ranks of employees, to the end that each day's work may be completed without injury to anyone. As on a football team or in a Flying Fortress, so in performing telephone work, coöperative effort is important to safe and efficient accomplishment.

The safety observation plan is not primarily a war measure to "conserve manpower for warpower." It is to help assure a continuing and effective safety program during the remainder of the war, during the postwar period, and for years to come. It is only through the administration of organized activities such as the safety observation plan, designed to make full use of the combined experiences and coöperative efforts of thousands of telephone men, that favorable results continuing year after year can be achieved.

THERE ARE 12 cities in the United States with a population of 50,000 or more which are served by independent telephone companies. Lines of all of them are connected with the Bell System. The cities are: Durham, N. C.; Erie, Pa.; Fort Wayne, Ind.; Johnstown, Pa.; Lincoln, Neb.; Long Beach, Calif.; Rochester, N. Y.; St. Petersburg, Fla.; San Bernardino, Calif.; Santa Monica, Calif.; Terre Haute, Ind.; and York, Pa.

Maintaining Interest in Customers When We Have Nothing to Sell, and So Handling Contacts as to Gain Their Understanding, Are Today's Business Office Objectives

We Don't Like to Say "No"

John W. Ord

"IF ANY of you listening in are among those who would like to have telephone service in your homes but haven't been able to get it, we want to say that we here in the Bell System don't like to use the words 'No' and 'We don't know when' any more than you like to hear them.

"We have a pretty good idea how you feel when you want telephone service and can't get it. We know how 'We're sorry' sounds to you when, as an applicant for new service, you move into a new place and find that the previous tenant's telephone must be put back into the common 'pool' to fill an order ahead of yours —or when you ask just how long you'll have to wait and we are unable to tell you.

". . . your patience, coöperation and understanding are genuinely appreciated by all of us."

That statement, voiced in behalf of the Bell System during "The Telephone Hour" radio program on June 19, 1944, bespeaks particularly the feelings of some ten thousand women service representatives handling contacts with the public in the business offices of the System companies and men who act as outside representatives. That these representatives should show such an interest in customers is no accident: it is due to a determination to maintain the best possible service in handling contacts with customers, despite the difficulties which the telephone companies face under war-time operation. Some measure of these difficulties is furnished by the fact that the Bell companies are holding on their waiting lists more than 1,250,000 unfilled requests for main telephone service.

The maintenance of good business office service in the face of these and other war-time difficulties has been given special emphasis because of the unique and important place of the telephone business office in the relationship between customer and company.

The business offices handle about 40,000,000 incoming contacts a year, exclusive of payments, and these cover a wide range of subjects. When customers deal with a service repre-

Business office representatives . . .

sentative in the business office, they usually feel that they are talking to some one representing the management of the company and reflecting its official attitude. The impression upon customers is, therefore, most important; and the Spirit of Service has been established as being fully as essential in the conduct of business offices as in other phases of telephone operations.

The business office must of course be efficient in such matters as prompt attention to customers, and accuracy, for instance. But something more than efficiency is necessary for service to be fully satisfactory, and what are known as "overtones" in service have been stressed with the idea of making the business office a place with which customers like to do business: friendly, understanding, and giving its customers individual—as opposed to routine—treatment.

It was early in 1941 that the telephone companies first began to consider the possible effect upon business office service of having nothing to sell.

The illustrations on this and the opposite page are from a specially developed slide film, "Selling Shortages," which was used throughout the System to help establish point of view in handling applications and to encourage study of the best contact technique.

It came up in connection with a program of conservation of telephone facilities and materials which the Bell System undertook voluntarily when the possibility of war focussed attention upon national defense. This program called for a change from the Bell System's traditional sales policy of promoting the use of the many items of telephone service through

. . . are key figures . . .

discussion with customers of their use and value.

The business offices had participated actively in sales work. In 1940, for instance, more than 800,000 additional items of service were installed as a result of their efforts. If business office people were simply asked to stop selling, the quality of business office service might be affected—because experience had shown that selling stimulated increased interest in customers and service, for the very simple reason that in order to sell, one must please. This point of view not only affected the handling of applications for service but also had a beneficial influence upon other types of customer contacts.

A great deal of thought was therefore given to planning and introducing the change from selling so as not only to achieve the best results from the standpoint of conservation but also to avoid any lessening of representatives' interest in customers. It was decided to treat it not as a retreat from sales but as a temporary change in sales direction to meet new conditions—never losing sight of an ultimate return to normal selling.

Promotion of the best use of the telephone services would continue, therefore; but it would not be directed, as hitherto, toward providing the greatest aid or convenience in business or the home, but toward helping customers to get along with minimum telephone facilities and making the most efficient use of their existing equipment. The appeal to customers would be to coöperate as a voluntary contribution to conservation of materials, thereby assisting national defense. As much care was taken to establish this point of view in the business offices, and to develop appropriate techniques to help in discussion with customers, as business men would expect in a campaign to build up dollar sales.

. . . in gaining customers' . . .

This approach appealed to the representatives because of its timeliness and sincerity. They no longer discussed, for example, the convenience of another telephone in the home or the advantage of an individual line over party line service. If customers asked for these better services, representatives showed the same enthusiasm they did in selling, as they explained the need for conservation and determined whether the customer could "make do" with what he had. Any apparent contradiction of their past sales activity was avoided by making it clear that they would like to provide these better services and that they appreciated the sacrifices involved in doing without.

In such ways as these, interest in customers was successfully maintained. The coöperation of the public as well as the representatives was most gratifying, and there was a substantial contribution to conservation.

This proved to be only a curtain raiser before the big show; for instead of seeing if the applicant could do without, it became necessary soon

. . . understanding and confidence

after Pearl Harbor to start saying "No" to many customers applying for service or for changes in their service. The demand for telephones, business and residence, reached unprecedented levels. In view of the need for using critical materials and the telephone industry's manufacturing capacity for war purposes, the Bell System's voluntary program of conservation was superseded by Government orders placing limitations upon additions to telephone facilities and, under certain conditions, upon the installation of service for customers.

What Denials of Service Might Mean

THE CONNECTION of certain services, such as extension telephones in residences, was prohibited. Requests for other services, such as the main telephone in a residence, had to be denied in localities where a company ran out of facilities; and this condition became increasingly more widespread—until by the end of 1943 it was countrywide. As a result, requests for more than 2,500,000 of the many different items of telephone service have had to be denied since the spring of 1942.

Having actually to deny service to customers raised many serious questions.

Would refusal of service mean losing the telephone company a friend?

Might applicants think there had been some lack of foresight or shortcoming on the part of the company, particularly in case of facility shortages?

If applicants were told about the Government limitation orders—as seemed desirable—was there the danger of seeming to blame the Government, which would be neither fair (Government was only doing what was necessary to win the war) nor patriotic (any dissatisfaction might react upon civilian morale)?

As waiting lists grew, what should be done to make sure that every applicant would be treated fairly and without discrimination, would get service in his proper turn just as soon as facilities became available—and would feel confident that this was the case?

Even if at first the situation were patiently explained to customers, was there a possibility that after many months the feeling might develop among representatives that people ought to know by this time that they couldn't get service, with the result that indifference or even lack of politeness might creep unconsciously into tone of voice or attitude—affecting not only the handling of applications for service but all other types of contacts as well?

Other War-time Problems

IN A REPORT upon business office service in war-time, there is naturally so much to be said about the problems arising in connection with applications for telephones as to run the risk of losing proper perspective through failure to stress how seriously the impact of war threatened business office service in other respects.

As in the case of most other businesses, the upheavals of war caused force losses, formerly almost negligible, to rise to substantial levels. In many offices, the number of losses was equivalent on an annual basis to a

100 percent turnover in the force and in some places it was substantially greater.

To appreciate the potential effect of this force turnover, it should be pointed out that in order properly to represent the Company to the public, service representatives must possess

Various types of material are used in training and discussion and as publicity to help insure that contacts with customers will be well handled

good judgment and also the ability to absorb a wide range of information in view of the many different subjects arising in contacts with customers, often involving discussion of Company practices and policy.

With this turnover, a training job had to be done which would have been quite time consuming even if it had not been necessary to superimpose upon the regular job the wartime one of telephone shortages and denials. Furthermore, it may be noted that inexperienced representatives need much more supervisory assistance—a requirement difficult to meet at a time when many men supervisors had gone to war.

The situation was accepted as a challenge and an opportunity. Everything practicable should be done to give the best possible business office service on all types of contacts with customers. As to

those involving applications for service, there would be two main objectives. One was to insure full compliance with War Production Board orders (L–50 and its successor U–2). The other was to handle applications so as to assure full public understanding of the situation, confidence in the Company's administration and impartiality, and recognition of its continued interest in customers even when it had nothing to sell.

Utilities Order U-2

THE SUCCESS of this policy was most encouraging. When the job was looked at from this viewpoint, it was gratifying to see how much could really be done along constructive lines: so much that seemed so worth while and stimulated pride of accomplishment. The problems that had been regarded as difficulties began to appear in their broader and truer sense as stimulating war-time responsibilities.

Take, for instance, the Government limitation order now known as Utilities Order U–2. No matter whether it was considered from the standpoint of the War Production Board, the telephone industry, or the public, the service representatives really had a most unusual and appealing responsibility in its administration. Theirs was, in fact, a key position as regards compliance, in the education of customers, and in obtaining public acceptance of limitations.

As most customers had no practicable way of becoming acquainted with the terms of Order U–2 until they applied for service, service representatives had a fine opportunity to help in customer education. This required them, in turn, to become thoroughly familiar with the many and changing provisions of Order U–2 affecting customers. To obtain ready acceptance of the terms of the order more had to be done than just to tell customers what they could not have. It was necessary for representatives to understand and explain the underlying reasons for the different provisions.

The opportunity to be helpful was quite marked in the interpretation and application of two provisions of the order. One of these provided for installation of main telephone service despite limitations where its use was essential to "direct defense" or to "public health, welfare, and security," as defined in Schedule A of the order. Instead of simply quoting the language of the order, representatives could do much to assist customers by discussing with them their intended use or need of the service, to see if it qualified for immediate installation under Schedule A. Helping to determine the essentiality of service was no easy matter, in view of the wide variety of conditions under which service is used by seemingly endless types of enterprise; and much tact as well as business judgment would be required on the part of representatives.

THE OTHER provision concerned the right to appeal to WPB in instances where customers felt that inability to obtain service under the Order would cause them undue hardship. Without going so far as to stimulate appeals, representatives could be helpful by bringing the provision for appeal to the attention of customers who wished to claim undue hardship or

to have their case taken further. In cases where customers decided to appeal, representatives could assist them in preparing their case so as to facilitate its review by WPB, to which the company forwards the necessary documents.

The Results

TWO AND A HALF YEARS of operation under war-time conditions afford enough experience to warrant commenting upon results. They have been generally gratifying. Business office service is at its best levels, judged by such criteria of technical efficiency as "promptness of attention to customers," "accuracy of information given," and "action taken." The "overtones" of service have never received so much attention, and they reflect it. All the evidence indicates that a conscientious and effective job is being done with respect to compliance with government limitation orders, assistance to customers, and continued interest in them.

There have been some mistakes, omissions, and misunderstandings on the part of business office representatives. While these are no more than might be expected in an undertaking of such magnitude and character, they are all analyzed, none the less, so as to see how to keep them to a minimum.

It is a pleasure to acknowledge how inspiring the attitude of the public has been. People are generally understanding, patient, and coöperative. In war-time they generally seem to become more tolerant, and this in turn surely deserves special consideration. That the public is appreciative of such consideration is evident, and may be illustrated by some examples selected from the hundreds of letters received by Bell System companies.

In connection with applications for telephones, consider the following two letters, the first from a customer in Ohio:

"I don't know much about the telephone business. It has been my impression that when you wrote them a letter, it was a complaint of some kind. Mine isn't.

"I am moving from a one-floor plan house into a two-floor plan and naturally wanted two telephones. I knew I could not get two but that did not stop me from trying. I am only getting one.

"Never have I been turned down so courteously, graciously and tactfully. You are to be complimented on being able to train people to handle the public as this young woman handled me.

"Well, it wasn't necessary to write this letter but it was such an outstanding incident that I couldn't help it. Thank you for reading it."

The following letter is from a customer in Arkansas:

"I want to compliment your organization on the nice manner they say no to a prospective customer. I am a new-comer to the city and being such, I am more or less in the stage where I notice everything. Not long ago, a lady with the phone company called the writer and explained the fact that phone service was somewhat limited and now I have your letter with a more complete explanation. I think it is remarkable management that an organization as large and with as little over-all competition as the Bell Company can maintain con-

sistently such an attitude toward the public in general.

"Of course I still do not have a phone but your attitude is like a fellow scratching a case of itch. 'Makes you feel better anyway.' "

Public Attitude

THIS ATTITUDE is striking in the case of customers who have to wait for

ing criticism of limitations or appealing to WPB.

As applications for service account for less than a quarter of representatives' contacts with customers, the question may arise as to whether such employee consideration and public appreciation extend to all types of contacts, including those having to do with billing and collections. The

THROUGHOUT the Bell System, recognition of the importance of the service representatives' war-time job is accorded in various ways—such, for example, as this poster

main telephone service. Inability to get service is always disappointing and very often entails real sacrifice. Surveys show that lack of service causes real hardship to as many as twenty or thirty percent of applicants. Yet usually fewer than five percent of the customers denied service end their discussion with the business office representative by expressfollowing letter from a New York customer is, therefore, of interest:

"If this letter reaches the girl with whom I've dealt by telephone from time to time about my bill, I want her to know that I appreciate not only her courtesy, which the Telephone Company expects of her, but also her friendliness and good humor. It was a pleasure to deal with her, and I

hope she's assigned to my account again! Thank you for a great deal of good service."

Important factors in the achievement of these results have been the high quality of business office personnel and their spirit of service in accepting responsibility for pleasing and helping customers. How deep this feeling can be, particularly in these troublesome times, may best be illustrated by quoting a New York Company representative:

"At times we may overlook the importance of our daily contact with our customers. It is our job, and we may fail to see the green grass in our own pasture. How can anyone accurately judge the good we have done by listening sympathetically to a customer's story of misfortune? How can anyone judge how much good has been done by an understanding word to an impatient or irate customer whose nerves may be worn thin by personal worry and anxiety? Our part goes further than building customer goodwill—it helps build morale."

Planning Ahead

THE System companies have continued to maintain high standards in the selection of the employees who will represent them to the public, and this has been most effective in maintaining the Bell System "Spirit of Service" in the business offices. The development of this sense of responsibility for service starts with the first interview with a prospective employee, and never ends. It has been continuously stimulated by fostering pride in accomplishment and belief in giving the best service possible.

A very active program has been undertaken by the Commercial managements of the companies to assist their business office organizations. In fact, the resources of the entire System have been mobilized to help in making "estimates" of the situation from time to time, in planning, evaluating experience, and otherwise checking results.

SHE HAS THE VOICE
WITH A SMILE TOO
•
She's your personal representative at the telephone company—the girl in the Business Office
Any time you'd like to know anything about service, or equipment, or bills, or wartime telephone regulations, she's there to help.
Sometimes, because of the war, she cannot give you the exact type of equipment or service you want—or just when you want it.
But you can be sure of this:
She will do her very best at all times and do it promptly, efficiently and courteously.
BELL TELEPHONE SYSTEM

NATIONAL advertising helps customers to appreciate the assistance which the representatives can give

The A. T. & T. Company has, of course, participated throughout: by staff studies, by visits to the companies, by the interchange of experience, by participation in inter-company meetings, and by representing the Bell telephone companies as a group with WPB.

In anticipation of the many problems which seemed likely to arise un-

der continued war-time operation, a series of inter-company meetings was held in the fall of 1942 to discuss plans for strengthening business office management so as to be sure of meeting the test of difficult conditions ahead. Three series of inter-company meetings have also been held to review experience and plan ahead in connection with business office administration under Government limitation orders and the handling of applications for service.

All of these meetings were paralleled by similar meetings within each company which were in addition to their own frequent experience meetings. In this way the experience, plans, and ideas of all the companies were made available for the benefit of each company, each office, and, in fact, each employee in it.

This process of periodic planning ahead, followed later by checks of results, has been most productive. In addition to being carried down the line of organization to each exchange, it covers the activities of the staff groups also.

Training and Supervision

THESE staff groups have made sure, for instance, that the business offices had the benefits of the best training assistance. Initial training procedures have been so improved as to cut down by two weeks the time taken in this training.

Training material has been revised not only to incorporate new or changing information or background, as in connection with Order U–2, but also to promote the discussion of contact techniques. As much study is given to the latter as American sales management is famous for giving to the sales contact. No attempt is made, however, to teach canned contacts or talks; the emphasis is on understanding, point of view, analysis of experience, and the principles of expression.

"Manning" of business offices, or force adjustment, has been given special attention, not only to insure customer satisfaction through prompt attention but also because a rushed feeling handicaps employees in furnishing a service with that high degree of accuracy and "overtones" which is their objective. Additional supervision has been furnished to the extent necessary. In many Companies a new form of business office organization has been introduced and women supervisors assigned to assist the managers. The management of business offices has been strengthened through special training courses, in which a specially developed manual has been used giving the latest experience in the System on the application of the principles of management in business office operations and the maintenance of the best possible personnel relations. All levels of supervision, men and women, from the top of the Commercial Departments down, have participated in this training.

"Overtones"

AMONG the aids to management in the administration of the day-to-day job, one of the most helpful has been the constant analysis of the quality of "contact" service. This analysis has provided the basis for determining what opportunities exist for improvement and what corrective action should be taken. For many years before the war, a rather precise method

of analysis had helped in maintaining the promptness of attention to customers, the accuracy of information given them, and the correctness of any action taken. But while the "overtones" mentioned earlier had also had a great deal of supervisory attention, the apparent difficulty of measuring intangibles was such that not until 1942 was a practical method of analyzing "overtones" developed.

It could not have come at a better time, in view of the unusual need for pleasing and helping customers—especially those applying for service. It focussed attention upon five essential features of good "overtones": "Speech," "Courtesy," "Understanding the Customer," "Quality of Explanations" and "Service Attitude." The standard of judgment used was not to find out what was poor but what fell short of being definitely very good. This approach appealed strongly to the business office personnel and proved to be a highlight of the service maintenance program, stressed in training and inspirational leadership.

Care of Held Applications

A DESCRIPTION of the care taken of the so-called "held applications" of customers waiting for service may be of interest.

Customers have a right to expect that their applications are not overlooked, and will be completed in their proper turn just as soon as facilities are available; and, as mentioned previously, good service requires also that they should be made to feel confident that this will be so. Special provision has, therefore, been made for the care of the held applications. There is a centralized control file for each office, where suitable precautions are taken to insure keeping them in their proper turn and to check them as central office equipment, outside plant, or telephone sets become available.

Since it promotes confidence if an applicant calling up to inquire about his application finds that the representative he talks to has his application readily at hand, duplicates of applications are maintained practically within arm's reach of the representative to whom the calls from that applicant will normally be routed. As additional evidence of care and interest, the companies are generally following the practice of writing applicants at intervals.

THIS ARTICLE is only by way of a progress report on the job done under war-time conditions by Bell System business offices in handling not only applications for service but all types of contacts with customers. It covers operations up to June 1944. The job done cannot be fully appraised at this time. It may well be that the final report cannot be written until facilities are fully available again everywhere, and waiting lists disappear.

While no one can say with certainty what problems lie ahead in customer relations—or limitations—this much is definite: telephone business office people are convinced of the importance of alertness to changing conditions and the value of doing everything practicable to give the best possible service, come what may.

Provision of Pleasant Rest Rooms, Lounges, Cafeterias and Other Quarters for Employees Has an Important Part in the System's Successful Employment Program

Recreation Facilities for Bell System Women

Raymond A. Steelman

LAST YEAR the Bell System hired more than 122,000 telephone operators, and another 28,000 women for other kinds of telephone work. There were more women on the System's payroll in 1943 than in any one of the preceding 65 years of the industry. The hiring of large numbers of women continues.

To employ so many women in that year—and most of them in places where employment conditions were anything but easy—was in itself an accomplishment. By implication, the reputation of the employer just had to be good.

What factors combine to give an employer a good reputation? Among the points which contribute to employees' satisfaction with their jobs are such things as their wages, of course, and their supervisors, their associates, and the environment provided for them by their employer. Ranking high as a reason which attracts people to telephone work, and for continuing in it, are the facilities regularly provided for the convenience and relaxation of the workers: such matters as rest rooms, lounges, and cafeterias.

Thus the System's high standards for such quarters, built up not over night but over the years, play an important part in attracting as well as holding new and much needed workers in the vitally war-important telephone industry. That they are doing so is illustrated in some part by the pictures, from many sections of the country and mainly of pre-war installations, which appear on the following pages.

WAR HAS BROUGHT many new problems to the men and women who are charged with the supervision of these quarters.

So that these facilities, which have such a direct effect upon the happiness and satisfaction of telephone workers in their occupations, may continue to serve their purposes well, it is essential that they be maintained with care and good taste. And in these stressful days, there is more need than ever that the quarters used by the employees during their off-duty periods should not be allowed to become drab.

A Lift to Morale

EVERYONE with a home recognizes the lift to his or her spirits—morale is merely a war-time word for it—that comes from new paper or fresh paint on the walls, gay new curtains at the windows, or even just some colorful new accessories. So it is around a telephone building: when rest room or lounge or cafeteria is redecorated or refurnished, and in a cheerful new color scheme, the employees get a good deal of added pleasure out of the facilities which are theirs to use. Where such things can reasonably be done under war-time conditions to add to the pleasantness of the working days of the nation's telephone women, the effort is well repaid.

By no means all the activity has been concentrated on maintenance of the various quarters which were in existence before the war. A few new central offices have been established where none previously existed, and in them new facilities have been installed. Many offices which were small before the war now have hundreds of operating employees, and quarters which were once adequate have had to be enlarged. Special problems have arisen in connection with providing meals and quarters for several thousands of operators who have had to be "imported" on a voluntary basis in many communities, large and small, to augment the central office forces handling heavy traffic occasioned by large military establishments or war industries nearby, or in some cases to operate the private branch exchanges in Army camps and posts.

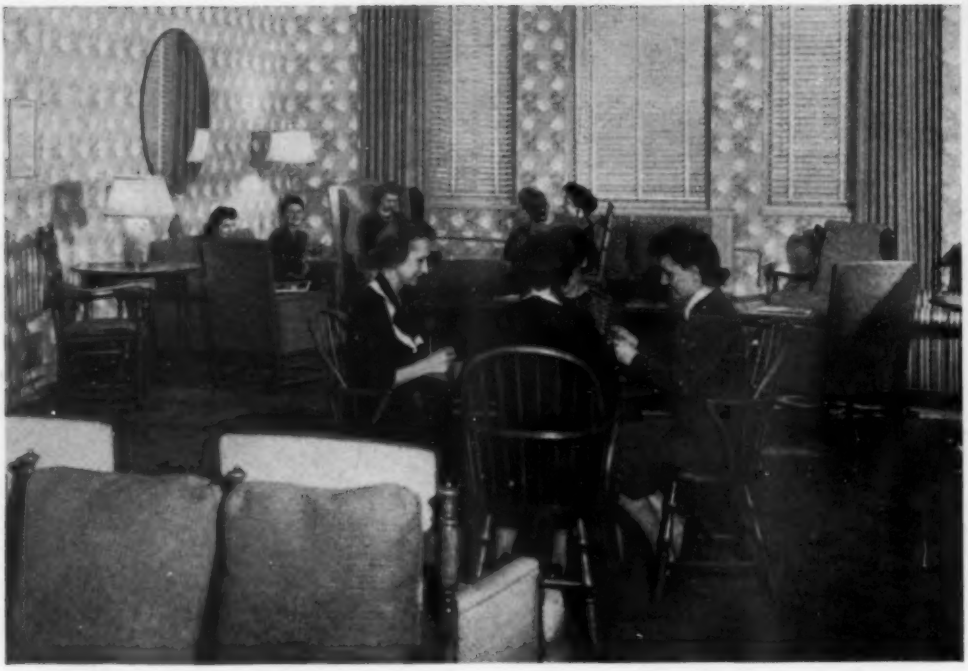
Particularly acute have been the dining service problems. Since the System's cafeteria enterprises do a business of nearly $8,500,000 a year —even at their normal low prices—it is not surprising that under conditions of shortages and rationing the administration of the dining service has become increasingly difficult. Getting enough of the right kinds of food to go around, compensating for restricted deliveries from suppliers, obtaining and retaining dining service employees, have been some of the major headaches.

IN SPITE of them, much has been accomplished. A few new cafeterias have been installed and some have been substantially enlarged. Many cafeterias formerly closed on Sundays and holidays now remain open on those days; many are now kept open much later in the evening than formerly; many which once closed at night are open 24 hours a day. Not all the night shifts are at munitions factories and airplane plants; operators play their part in war production too, and the cafeterias give service largely for their convenience.

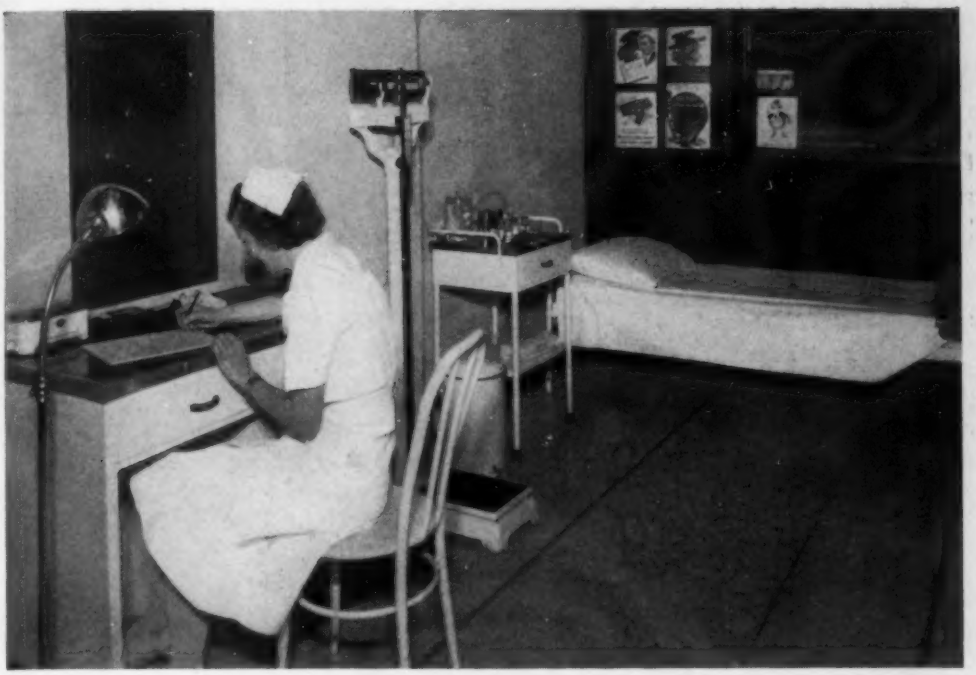
Quarters' staffs have had to exercise a good deal of ingenuity in making use of what has been available to work with. Some second-hand equip-

Who couldn't relax for a few moments in such pleasant surroundings as these? Comfortable chairs and sofas, current magazines and good light to read them by, telephones, desks and writing materials, and a harmonious decorative scheme are features of the typical lounge for women employees. In some buildings where large forces are employed, separate smoking rooms (below) are provided too.

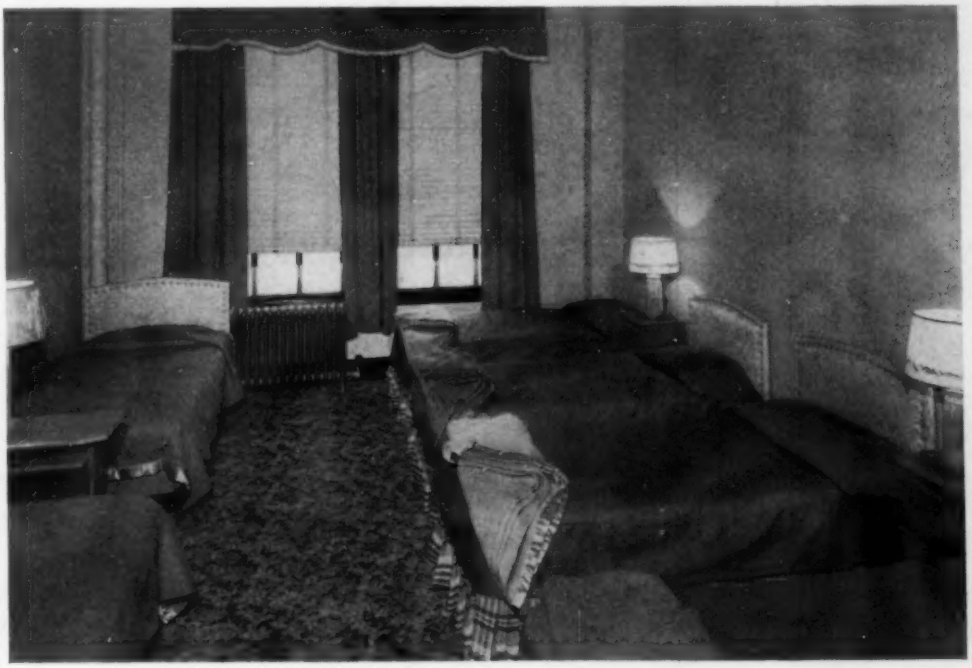
CONVENIENCES such as those above make it easy to write to friends and relatives in the armed forces. To emphasize the contribution of telephone service to the winning of the war, some companies furnish stationery imprinted with "Serving on the Home Front" or similar phrases. A "powder bar" like the one below is a help to good grooming on the job and when leaving for home or a "date."



FACILITIES for a rubber of bridge or a bout of table tennis are available in some of the large telephone buildings.



In some central offices, particularly those having many operators who are living away from home, a graduate nurse is employed. She helps the chief operator with health matters, is available for consultation or first aid, and visits operators who are ill. A "quiet room" (below) for operators who feel indisposed or who want to rest during lunch or "relief" periods, is an adjunct in many operating buildings.



To HOUSE the operators rendering telephone service at Army camps and at other localities which have mushroomed because of the war, many telephone companies have had to build temporary dormitories or rent large residences such as that above. They include comfortable living, dining, and bed rooms, and are under the management of house mothers who also have supervision of the various social activities.

When the size of the force and the location of the building are such as to justify it, cafeteria service provides meals for employees at moderate prices. Equipment must be modern and efficient and the staff competent to provide economical operation of a pleasing service.

In some large telephone buildings, soda fountains (above) are a popular supplement to the cafeteria counter. In many smaller telephone buildings, facilities like those below enable operators to prepare their own light lunches.

THE LARGE CAFETERIA above is notable for its gay color scheme, attractive counter, and unusual wall treatment. The "nooks" formed by benches placed back to back in the smaller room, below, give it an atmosphere of cozy informality.

A "SNACK ROOM" like that above is sometimes a solution to the problem presented by lack of space for a complete cafeteria in a building with an expanded war-time operating force.

ment of one sort and another has been picked up and reconditioned when necessary, and substitutes have of course been used to good advantage. In one very busy war center, for example, all facilities of the kind under discussion had to be moved out of the telephone building to make room for a greatly expanded switchboard and its associated equipment; so an old brick structure adjoining the central office building was acquired and rejuvenated, doors were cut through, and all the quarters were established in it. Since no other space was available, a cafeteria was set up in what had been the cellar; and while it is not all that might be desired, bright lights, and bright colors on the walls and floor and furniture, give the room a pleasant atmosphere. The service is much appreciated, too, because there is no other place nearby where good food can be obtained.

THE WAR-TIME SPIRIT of the women of the Bell System is high. Many things contribute to this, of course. Among them may be counted, surely, the facilities and the services which this brief account has reviewed. Before the war, the intent was to make them adequate and attractive. The present task is to keep them that way —to the limit that space, labor, materials, and thoughtful ingenuity permit.

When a Circus Burns

Raymond A. Loring

TRAFFIC was moving smoothly in the Hartford telephone office at 2:30 Thursday afternoon, July 6. Outside, heat beat down on the blistering streets—humid heat which made the 90-degree temperature seem more like 100.

Telephone operators on relief sipped "cokes" in the cafeteria and allowed that they were much better off than the folks out at the crowded circus grounds. The Ringling Brothers' greatest show on earth had pulled into Connecticut's capital city the day before, too late for its matinee, so this afternoon's performance had attracted an unusually large number of women and children.

And then suddenly, at 2:40, it was no longer just a hot summer afternoon in Hartford. Through the operating room flashed a message which was to set off the greatest rush of frantic calls ever handled by the Southern New England Telephone Company's biggest office—greater even than any 24-hour load during the disastrous flood of 1936 or the hurricane of 1938:

"The circus tent is on fire—yes, the Big Top!"

It's unbelievable, fantastic. That was the instantaneous reaction. If it were true—but that was too horrible to contemplate.

Prepare for the worst, said the traffic people as they sped the report to the plant department. Still they hoped it was an exaggerated rumor.

That hope was short lived. A plant man who had been watching the performance called in. "Hey, boss, all hell's loose out here. The Big Top's one big blaze. Women and kids are being burned and trampled . . ."

There was no doubt now. Already emergency calls were speeding through the switchboards. Send ambulances. Call all doctors and nurses. Tell the hospitals and Red Cross to get ready for the casualties.

With the speed of the flames which consumed the tent, word of the catastrophe spread through the city. Operators on relief rushed back to their positions. In an unbelievably short time, off-duty girls, operators on vacation, and former employees came on the run, oblivious of the heat. . . . The "spirit of service" is no empty phrase in the Bell System.

Nor is this spirit limited to one group. From the plant department went word to route all telephone cars to the scene to help in rescue work and to establish emergency service. Some picked up nurses on the way. One man helped a hysterical woman and child who couldn't remember what had happened and in their frenzy couldn't find their way home.

Even as the plant men converged on the circus grounds it was hard to comprehend the extent of the tragedy. The shrieks of the dying and injured mingled with the hysterical cries of frightened children and the wails of

ambulance sirens. In little more than half an hour a scene of gaiety became the most spectacular and frightful disaster in Hartford's history. The death toll was to mount to more than 165, the list of badly injured to a larger figure. And for hours to come, the telephone was to be the means of directing relief, answering desperate queries, and allaying the fears of agonized relatives and friends not only in the city and its suburbs but throughout the state and nation.

EVEN BEFORE the fire was extinguished, an emergency telephone center had been set up and was in use for directing relief work.

While the canvas still blazed, plant men ran extra lines into the circus lot and established an emergency telephone center for the use of police, fire, and rescue officials. Commercial representatives were on the spot almost all night to aid those who were placing calls. First to use these facilities was the mayor in directing early phases of relief work. Later these telephones were a real boon to circus people who wanted to rush word of their safety to distant relatives.

Installers were dispatched to the city's hospitals to add lines, and traffic's PBX instructors and commercial people aided the regular operators at these boards to handle the tremendous traffic. PBX repairmen were stationed at these boards, as well as at police headquarters and at emergency installations, to guard against any breakdown in the equipment. Back in the central office, plant men watched for alarms and call blocks in the dial equipment. Two traffic overflow desks were wired and held

for relief of any PBX that might prove unable to handle its load.

Evidence of the Tragedy

A LITTLE MORE than an hour after the first fingers of fire had reached up the side of the big tent, the central office battery discharge, normally 650, was 1150. Emergency Diesel engines, on test that afternoon, were continued in service to augment the regular power. Dial equipment experienced unprecedented loads, but it met the test and no emergency measures for control of dial traffic became necessary.

Up in the block-long operating room was growing evidence of the extent of the terrible tragedy. Every position at all boards was filled; 250 girls were on duty as compared with a normal force of 150. All afternoon and far into the night these girls, many of them new in the business, worked on. There was no thought of supper, no thought of going home. The cafeteria staff made extra sandwiches, more ice cream was brought in—and operators stopped only for a snack.

Despite radio announcements and the publication of information in newspaper extras, thousands of calls requesting all kinds of assistance were received at the toll board and at information positions.

A Toronto, Canada, newspaper wanted an eye-witness account of the disaster; an out-of-state doctor gave some specialized advice; a spokesman for Western Electric employees in New York offered blood plasma to any injured telephone people; a newspaper syndicate wanted a telephoto circuit; another needed teletype connections; and early Friday morning a man telephoned from South America trying to reach his brother who is an animal trainer with the circus.

Coin telephones, especially in the area of the circus grounds, were being used extensively by those trying to locate relatives from whom they had become separated. Others were calling home to say they were safe. As hundreds had come to the circus from surrounding communities, there was also a record volume of short-haul traffic to and from nearby exchanges.

Authorities selected the state armory as a temporary morgue, with the state police in charge. Here a battery of 15 telephones was hastily installed to serve as an information bureau. It was manned by girls from the telephone business office and the plant department. These girls handled an estimated 10,000 calls in 12 hours. Some remained on duty until 3 o'clock in the morning; commercial and plant men carried on all night. Additional trunks were installed at two locations for the Red Cross and at a public school where the hundreds of lost children were held until called for.

EVERY Hartford telephone employee was on the job or assisting at hospitals and relief centers, 47 emergency local circuits were installed, local calls were going through without delay. And then a new problem arose. As news of the catastrophe was featured on the national radio hook-ups and in metropolitan newspapers early in the evening, incoming toll traffic reached new peaks. Southern New England and Long Lines engineers established additional emergency toll circuits to New Haven,

New York, Boston, and other centers, a total of 30 finally being pressed into service.

Because of the thousands of people involved in the affair and the difficulty experienced in identifying the injured and tracing missing persons (some 2,000 were reported missing at various times), there was little letup in telephone traffic all night. Not until almost noon Friday did the volume assume any semblance of normality.

Appreciation of the work of telephone men and women was expressed by Governor Raymond E. Baldwin in a personal visit to the emergency telephone room at the armory and in a call to the chief operator. Red Cross officials, newspapers, hospitals and others commended the ability of employees to keep their heads and do a good job under unusual stress.

To a shocked and saddened community, Hartford telephone people had shown their understanding in the way they know best; by providing helpful, friendly service.

"*Electronics—Today and Tomorrow*"

John Mills, Director of Publication at the Bell Telephone Laboratories, is the author of a new book, published by D. Van Nostrand Company, which bears the title quoted above. Mr. Osborne, who contributes the following review, is Chief Engineer of the A. T. & T. Company.

ELECTRONICS, except in name, is an old friend of telephone people. For many years electronic devices, particularly the three-element vacuum tube, have been basic in many of the advances which have kept the United States in the lead in telephone service, both by wire and by radio. Electronic tubes were used in establishing telephone service across the continent 30 years ago. They were an essential element in the first transmission of speech across the Atlantic 29 years ago.

Electronic tubes have been used for so many years and in such great numbers in the telephone plant that telephone people in general no doubt recognize their old friend in spite of the emphasis which is now being given to its new name. Many people in the telephone industry must have been amused by the slogan featured currently in the advertising of one manufacturer: "Every radio set made by ——— is an electronic device." In the broad sense in which the term is often used today, we might well say that every telephone conversation is an electronic phenomenon. Even in the narrower and perhaps more legitimate sense in which the author uses the term, as applying to tubes having a high vacuum or low gas pressure,

practically every long distance call makes use of electronic tubes.

The telephone man or woman who knows the importance of electronic devices in the telephone business, and desires to have a general idea of how they work, will find Mr. Mills' book, "Electronics—Today and Tomorrow" made to order. Mr. Mills undertakes to describe the phenomena of electronics in terms which are intelligible to the layman having some knowledge of physics. Although the subject matter is in the field sometimes referred to as modern physics, the phenomena are described to a surprising degree in the terms of classical physics: mass, velocity, electric and magnetic fields, etc. The structure of electronic devices is, however, very novel; and the attempt to describe how these structures work in a qualitative way in terms which are intelligible to a layman is a formidable undertaking. The undertaking is all the greater as Mr. Mills has chosen to do this without illustrations, except for the suggestive little sketches at the chapter headings.

Mr. Mills has done a remarkable job in his description. I think, however, the layman who reads the book would do well to renew at least a speaking acquaintance with his freshman physics, if he has allowed that acquaintance to lapse.

Reference has been made to the great application of electronic devices to telephony during the past thirty years. During that period, applications have been made also in many other fields: the radio broadcasting industry has been built upon electronics, electronic devices are used for all sorts of control operations, and during the past few years the military applications have been of great novelty and importance. Mr. Mills' brief references all the way through the book to current applications of importance add a great deal of interest to the lay reader. It is not a book specifically for telephone men. It is of interest to all who would like to acquire a general knowledge of this fascinating field of science.

HAROLD S. OSBORNE

Sound Movies for Sound Education

This account of the present status of Erpi Classroom Films, taken in part from The University of Chicago Magazine, *is by William Benton, Vice President of the University.*

UPON the recent acquisition of Erpi Classroom Films Inc. by the Encyclopaedia Britannica, Mr. Hutchins [President Robert M. Hutchins of the University of Chicago] said that through classroom films the Univer-

sity of Chicago has perhaps a greater chance to influence American education in the next twenty years than through all the rest of its activities put together. President Hopkins of Dartmouth seven years ago compared the coming development of the classroom film with the invention of printing. For decades many men in education and outside of it have agreed that in the classroom film lies the potential of an educational revolution. America has had entertainment moving pictures for almost half a century. Why, then, have so few films suitable for the classroom been produced and distributed to the schools?

FIRST, producers who have known the techniques of production have not correlated their knowledge with the knowledge of educators. This is in part due to the resistance of the educators. Educators, like other people, will resist anything which compels them to change their habits. Educating the educators is perhaps the longest of all educational jobs.

A more important reason, perhaps, is the nature of the moving picture industry. The big companies have not known good instructional films from bad ones. They have always concentrated on the quick-profit opportunities in entertainment pictures. The two fields are entirely different, as different as a textbook on physics and the *Saturday Evening Post*. Only one company has produced instructional films in collaboration with educators. This company has been a wholly owned subsidiary of the American Telephone and Telegraph Company.[1] It is Erpi Classroom Films Inc. E-R-P-I stands for Electrical Research Products Inc.

In 1932 the University of Chicago started to produce classroom films through a contract with Erpi. These were the first talking films produced on any university campus. During the past twelve years forty University of Chicago films, made specifically for the general courses in the College, have been produced under this contract, with the result that our faculty has learned more about making classroom films than any other faculty has had a chance to learn.

Since 1930 the phone company has invested more than $3,200,000 in Erpi Classroom Films.[2] The company is small, but it is the giant of its field. Perhaps two thirds of all the films shown in the classrooms of the country today are Erpi Classroom Films. These films are made for all school grades, from nursery school through college. Some of the college films, incidentally, are shown successfully as low as the sixth grade. The so-called "library" of Erpi films now exceeds two hundred in number, all designed for use by the teacher, all integrated with existing curricula, and all produced in collaboration with educators at various institutions.

THESE FILMS do not go out of date. Some films made nine and ten years ago are selling better than other films made last year. The films average about eleven minutes in length. Dozens of scholars often collaborate in the making of just one film. They are made to be shown *after* instruction by the teacher, *after* textbook and laboratory study, and they are

[1] Erpi Classroom Films Inc. was owned by Electrical Research Products Inc., a subsidiary of the Western Electric Company.—*Ed.*

[2] The investment was made by Electrical Research Products Inc. out of profits from other motion-picture activities.—*Ed.*

shown *again* and *again* to the same students during the course of the year's instruction.

Mr. Hutchins, believing that the development of classroom films should be in the hands of educators, made his first effort to wean Erpi Classroom Films away from the telephone company in 1937, the year I joined the University. One of my first assignments was to work with Mr. Hutchins, and with Nelson and Laurance Rockefeller, on a presentation to the Rockefeller Foundation urging the acquisition and development of Erpi Classroom Films. As far back as this, A. T. & T. itself frankly conceded that it could not do justice to this field; its position as a big utility company forbade the development of needed films in the social sciences. Economics, sociology, and political science involve controversial material that the phone company could not risk.

Following the gift of the Encyclopaedia Britannica to the University by Sears, Roebuck and Company a year ago, Mr. Hutchins wrote Mr. Gifford proposing the gift of the Erpi Classroom Film company to the University of Chicago. Reticence is not a valued characteristic in university presidents. Out of this letter grew a fifty-four page printed contract by which the Encyclopaedia Britannica has purchased Erpi Classroom Films through an issue of debentures, representing the book value of Erpi, to be retired over a period of years out of profits of the Encyclopaedia Britannica, and, it is hoped, out of profits from classroom films.

The management personnel of Erpi Films will continue unchanged under Britannica's ownership, and selling and pricing policies will continue as in the past. The association of Erpi with the University will make fully available the broad knowledge and pedagogical skill of the University staff and should result in an expansion of production of films for classroom use and perhaps of extracurricular films for use outside the classroom.

Picture Credits

PHOTOGRAPHS illustrating Gen. Ingles' article were obtained from the following sources, reading from top to bottom and left to right on the pages numbered:

70—Signal Corps from Acme Newspictures, Signal Corps (middle and bottom)
72—U. S. Navy (top and bottom), Army Air Force
73—Acme, International News, U. S. Navy
74—Signal Corps, War Pool from Acme
76-7-8—Signal Corps (all)
80—Signal Corps (top and lower right), Acme
82—U. S. Navy, Marine Corps, Coast Guard
84—Signal Corps (top and bottom), U. S. Army from British Combine
86—War Pool from Acme, Signal Corps from Acme
87—Marine Corps, International, Signal Corps
88—Navy from Acme, Acme, Signal Corps
90—Army Air Force, Army from British Combine, Signal Corps

For the Record

A selected list of happenings, of System interest, occurring between May 1 and July 31, 1944

AT THE regular meeting of the Board of Directors of the A. T. & T. Company held on May 17, a quarterly dividend of $2.25 a share on capital stock was declared payable July 15 to stockholders of record June 15.

The War Production Board on May 19 authorized the manufacture of 800,000 telephone sets for civilian use. Permission to resume manufacture was largely due to the decision of the Western Electric Company, which will make about 80 percent of the total number, to move machinery and equipment from its Hawthorne and Point Breeze plants to St. Paul, Minn., where labor is readily available. It is not expected that actual production of a substantial number of new sets will begin before the last quarter of the year.

The "D-Day" announcement of the Allied invasion of the coast of France on June 6 was transmitted to this country over a transatlantic radio telephone hookup. Plans had previously been made by the Army, with the coöperation of the Long Lines Department, for the handling of just this situation; and twelve minutes after the Army had given advance notice that an important announcement would be made from London, the words of historic Communiqué No. 1 came over the air from England. All principal broadcasting and news agencies in this country were able to hear them. Brigadier General Frank E. Stoner, Chief of the Army Communication Service, sent a commendatory letter to the Long Lines Department for its handling of overseas communications on D-Day.

The A. T. & T. Company received FCC authorization on June 20 to build experimental radio stations in New York and Boston for a wide-band point-to-point repeatered radio telephone circuit capable of operating simultaneously in both directions between the two cities. (See "The Bell System's Interest in Program Television," MAGAZINE, Spring, 1944.)

A "Certificate of Appreciation" was presented to the A. T. & T. Company by Major General Harry C. Ingles, Chief Signal Officer, A. U. S., on June 23. The ceremony took place in the lobby of the Headquarters building at 195 Broadway, and President Walter S. Gifford made the address of acceptance. (See frontispiece of this issue and quotation on page 71.) Although others have since been presented to a number of communications companies, this was the first such certificate to be presented to a telephone organization.

Commissioner T. A. M. Craven retired from the FCC at the expiration of his term on June 30.

July 5 marked the fortieth anniversary of A. T. & T. President Walter S. Gifford's service in the Bell System. He started as a clerk in the payroll department of the Western Electric Company in Chicago.

Revisions of Utilities Order U-2 were issued on July 17 by the War Production Board. Principally, the changes add some flexibility to plant operations by removing direct limitations on drop and block wire and exchange line plant, and provide additional categories of preference, Schedule B and Schedule C, in completing residence service applications in certain cases.

James W. Hubbell, President of the New York Telephone Company since 1941, died on July 20. On July 26 Carl Whitmore, Operating Vice President of the Company since 1941, was elected to succeed Mr. Hubbell.

It was announced on July 25 that rates for overseas telephone service to Argentina, Brazil, Chile, Peru, Colombia, Puerto Rico, and Haiti were to be lowered generally, beginning on August 1.